Chapter 8

Reclamation Legacies

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Coastal reclamations

Coastal reclamations extend human terrestrial habitat into the sea by the mechanism of draining wetlands and mudflats or dumping soil, rock and dredged marine sediments into coastal waters to expand coastal terra firma or create artificial islands. The 're-' in the word 'reclaiming' implies a prior ownership, an implied claim that all space is incipiently human habitat. The privileging of human occupancy over that of other species, which has led to intertidal and marine space occupied by fish, crustaceans and seagrass being classified as waste (van Dooren 2014: 77), is mirrored in colonial practices of classifying Indigenous lands as waste or barren land, as seen in the colonial mapping of parts of the upland rainforest of Borneo (Peluso 1995; Tsing 1993) where the 'barren' classification has been a preliminary to the issuing of logging and mining licences. While the reclaiming of the littoral zone for agriculture has been proceeding for about 1,000 years in Asia and Europe, the acceleration seen in the rate of reclamation (for agricultural, industrial, infrastructural and residential purposes) over the last two to three centuries has been driven by the growth economics of capitalism. Whether it is Indigenous land or the littoral zone which is being colonized, the rapidly expanding rates of commodity consumption over that time have produced a corresponding expansion of the human ecological footprint, measured in terms of "the area of land or sea needed to produce the resources consumed by a given population and absorb its waste" (Bonneuil and Fressoz 2016: 245; see also Moore 2015). Coastal reclamations are part of that expansion, forming an element of capitalism's "second nature" (Bonneuil and Fressoz 2016: 22).

Coastal reclamations are a signature landform of the Anthropocene, an epoch that for the reasons given above might better be termed the 'Capitalocene' (Moore 2015). Their expansion over the last century or so is exemplified in the fact that 11,000 kilometres of the coast of China is now under some form of reclamation, half that country's coastal wetlands having been destroyed by reclamation between 1950 and the year 2000 (Ma et al. 2014). In Tokyo Bay, when you stand on one of the newer artificial islands that are still mostly bare soil, it can seem as if this land, which is devoid of vegetation, has been newly exposed by a withdrawing sea, evoking the retreat of the sea that occurred 115,000 years ago at the onset of the last glaciation. Actually, of course, the sea is currently rising, not shrinking, not withdrawing. The sea is growing in volume, as it did at the *end* of the last glaciation, about 11,000 years ago, only this time it is a result of thermal expansion of seawater as an effect of anthropogenic global warming. The sea is now pushing back against the walls of our reclamations, creating waterlines that are a zone of nervousness and stress. This zone is a good place to think about territory, territorialization, loss and the future.

Reclamation counterfactual

I want to draw here on Claire Colebrook's (2017) concept of an 'Anthropocene counterfactual', which she laid out in her chapter in the volume *Anthropocene Feminism*. There she identifies one effect of the Anthropocene as being a new self-consciousness among us of our role in imposing difference on the world, this coming after an era of feminist and queer work devoted to dismantling the idea of intrinsic difference – notably gender and sexual difference – in favour of a kind of *indifference*. Reclamations can stand as examples of what we now see as absolute difference-making by humans: hard-edged platforms of new land are superimposed on what in many cases were complex intertidal ecotones. But with her "Anthropocene counterfactual," Colebrook (2017: 5) sees the world possessing a "complexity that will always exceed any differences we read into the world" – it possesses, in this sense, a kind of "indifference" to human difference-making.

One element of Colebrook's argument is that we should pay more attention to the points at which we have imposed difference and ask – and

this is where the counterfactual comes in – what would have happened if we had not inscribed this difference?

> If the Anthropocene is the return of difference – because humans are once again exceptional, but now in their destructive and inscriptive impact – it might be worth asking how such difference operates. What might it mean to think a counterfactual scenario where humans had *not* inflicted the difference of the Anthropocene on the planet? (Colebrook 2017: 5).

Three years ago, I began a study of the history of coastal reclamations in the Pearl River Delta in Southern China, a region where land began to be reclaimed for agriculture around a thousand years ago (Byrne 2018). I am now pushed to ask what difference it is that these reclamations have inscribed. The earliest reclamations in the Delta involved the simple expedient of placing a row of rocks out in the mudflats, parallel to the shore. At high tide, delta waters bearing a heavy sediment load would sweep over the rock boundary and with the retreating tide leave behind enough of that sediment that over the space of a few years a deposit of sediment would build up inside the boundary of stones. This deposit would eventually become a new rice field. This process mimicked the natural process of delta formation (Bianchi 2016) in which riverine waters slow as they approach the sea, causing them to drop much of their sediment, so forming mudflats which, with repeated floods, become perennially dry land. The farmers and the lineage trusts which since Ming (1368–1644) times took a leading role in reclamation projects (see Faure 2007) can be seen to have emulated this natural fluvial process in order to accelerate land creation and to direct it to locations most favourable to them. You might say they have acted within the delta ecology to redirect it slightly. The reclamations grew almost by themselves, following a careful and subtle aligning of human intentions with the intentionality or force of natural processes. While conventionally we think of farming communities growing crops, here they were in a sense also growing land, or growing land in order to grow crops.

In retrospect, the *difference* made by these agricultural reclamations was less consequential for other-than-human lifeforms than the new kind

of reclamation – I will term it 'mechanical reclamation' – which began to be seen in the Pearl River Delta from the late nineteenth century. The paddy fields and fishponds that occupy the old reclamations provide habitat for a broad spectrum of wildlife, including migratory birds, reptiles and small mammals (Lou et al. 2014). By contrast, the new reclamations, which have been created to serve as platforms for industrial estates, container ports, residential development and airports, tend to be hostile to non-human life. They contain large expanses of concrete and other forms of Anthropocene rock that form surfaces which are more-or-less impervious and are more easily 'dedicated' to exclusive human use than is the case with agricultural reclamations.

While the fluvial sediments that comprise the agricultural reclamations were transported there by the gravity-impelled flow of rivers (the Pearl River Delta is fed by two main river systems), the 'substance' of the new reclamations, which includes demolition debris, urban waste, quarried rock and dredged sediment, is transported to the reclamation site mechanically. Fossil fuel burning earth-moving machinery (including graders and bulldozers, trucks and dredges) have allowed a vast redistribution of matter across space. This form of mechanical redistribution is characteristic of the Anthropocene. Whereas agricultural reclamations in the delta, relying on the motive power of water, could only be situated where this power was operative, fossil fuel enabled a reordering of the location of reclamations. In the words of Christophe Bonneuil and Jean-Baptiste Fressoz (2016: 203), fossil fuel "conferred on the capitalist the freedom to store energy and to mobilize it at a desired moment in the degree needed". Referring more specifically to coal power – and it will be remembered that the first mechanical reclamations, in the nineteenth century, were enabled by steam shovels and steam dredges – they observe that, "The steam engine made it possible to homogenize space, to ignore location, watercourses and gradients" (ibid). Finally, it will not escape notice that the purpose of some of the delta's largest new reclamations (the container ports and airports of Hong Kong and Shenzhen), formed by mechanical redistribution of matter over local and regional space, is to facilitate the mobility and redistribution of people, commodities and manufactured goods over transnational and global space.

Thinking counterfactually, as Colebrook (2017) encourages us to, means asking not just how the difference of reclamations operates but what would have happened if the difference of agricultural reclamations and then mechanical reclamations had not been inscribed on the natural-cultural space of the Pearl River Delta in the first place. The most obvious answer is that delta shorelines would today be radically different. Prior to the inscription of reclamations there existed a complex intertidal transition zone between land (as in dry land, or terra firma) and the sea, principally taking the form of mudflats and the mangrove ecologies they support. Reclamations, whether of the agricultural or mechanical type, collapse this transition. They emplace bunds and seawalls which draw a hard line between land (the new land of the reclamation) and sea, a line that tends to be drawn straight rather than curvilinear. Apart from their impact on intertidal ecologies, one of their other effects is that for many millions of humans, their most common contact with the sea now occurs at these sites of sharply drawn land-sea interface.

Figure 8.1 — Reclamations on the south side of Weiyuan Island, Dongguan City, in the Pearl River Delta. The buildings on the left were constructed on a mid-twentieth-century reclamation; the fields on the right are part of a late-twentieth- to early-twenty-first-century reclamation. (Photograph by Denis Byrne, 2018).

The production of flatness

In 2018, 55% of the world's population lived in urban settings.[1] There they spent much of their lives on anthropogenic surfaces, including on the formed surfaces of roads and carparks and on the horizontal floor surfaces of buildings which rest on levelled sites. Typically, these surfaces are flat, as are the surfaces of the great majority of coastal reclamations. While coastal reclamations function to expand the amount of terrain available for human terrestrial activities, a key element of this is their provision of flatness. Barry Higman (2017), in his book on the subject of flatness, maintains that the anthropogenic expansion of flatness has been fundamental to the Anthropocene.

Since deep in our hominid past, it seems to have suited us to eat, sleep and socialize on flat surfaces. The landscape architecture scholar, David Leatherbarrow (1999, 2002), has been particularly concerned with the platforms (or slabs) we create for houses to rest on and the platforms and the terraces we create for gardens, ponds, swimming pools and so on. He stresses the way we have privileged flatness as human habitat, and he describes the projects of levelling required to produce flat terrain in situations where it does not naturally occur. In the Pearl River Delta today – for example in Zhongshan prefecture to the north of Macao – everywhere one sees the raw scars where the sides of hills have been cut away to create flat terrain for factories and residential developments. In some cases, hills have been entirely excised from the face of the landscape for this reason. Much of the rock and soil, the material substance of these hills, has ended up being used to create new coastal reclamations or to extend old ones, meaning that flatness is achieved at both ends of the process. The impression you get in traveling through such areas is of a brutal reshuffling of earth materials, roughly emulating natural processes of erosion that would take millions of years to achieve something like the same levelling.

The human footprint on the Earth expanded slowly through the millennia when we were hunters and gatherers, more rapidly after we began domesticating plants and animals, about 11,500 years ago, more rapidly still from the time of the Industrial Revolution, beginning in the mid-1700s, and very rapidly in the period since World War II. Matt Edgeworth (2014, 2016) has introduced the concept of the *archaeosphere* as a useful

way of drawing attention to the fact that vast areas of the Earth are now covered by the modified soils and terraced hillslopes of agriculture, the concrete and asphalt paving of roads, airports and container ports, the underground infrastructure of tunnels, pipes and wiring below our cities, the burgeoning landfill sites and the reclamations which extend coastal terrain out into the sea. The archaeosphere is a layer of varying thickness that has expanded at an accelerating rate and nowhere is this more apparent than along the world's coastlines. On Japan's main island of Honshu, for instance, 60% of the coastline is now classified as 'artificial', which is to say that for the most part it is concrete.[2] Honshu has swapped much of its pre-existing coastline of beaches, dune fields and wetlands for reclamations that constitute an ocean of concrete forming a flat platform for the enactment of contemporary life – forklifts drive over it, kids bounce balls on it. Some of Japan's skateboard parks are located in this 'second nature' requiring concrete surfaces to be sculpted into the hills and hollows which 'concrete disciples' favour.[3]

Most of this concrete coast dates from the time of Japan's post-war 'economic miracle', beginning in the mid-1950s and representative of a surge in the pouring of concrete surfaces that began at that time in many parts of the world and has gathered pace since then. As an Anthropocene marker, this concrete, and the archaeosphere more generally, is likely to be much easier for most people to apprehend than the plutonium traces which fell to Earth following nuclear testing in the 1950s (Waters et al. 2017). This seems a good reason to find new ways to draw attention to coastal reclamations: whether they are characterized by concrete surfaces or not, they help make the Anthropocene visible in a tangible, graspable way. The ability of people to grasp the Anthropocene as a material reality seems a crucial prerequisite for any widespread popular mobilization against the dark future which it portends. But coastal reclamations can only serve this role once people understand that they are in fact reclamations and not natural landscapes. The problem here is that, once created, many of them, including those that support waterfront parks (Byrne 2017), come to seem natural in their own right and the point where they were sutured to the pre-existing coastline can be difficult to detect. For each new generation born into this habitat, the reclamation is "given in its sensuous certainty," to borrow the words of Sara Ahmed (2010: 241)

who writes that, "What passes through history is not only the work done by generations but the 'sedimentation' of that work as the condition of arrival for future generations". Trees sprout from the anthropogenic soil of many reclamations and their fallen leaves form humus that helps create the conditions for earthworms and other organisms to flourish in that soil. Plants, buildings and infrastructure spread across these new landforms, exaggerating the reclamation's appearance of longevity and making it more difficult for us to recall or imagine the beach or marshland it displaced. At the same time, perhaps we always 'know' reclamations for what they are. Thom van Dooren (2016: 200), in reflecting on the massive reclamations that house much of the Port of Rotterdam, has been inspired by Michel Serres's writing to think of such topographic alterations as *markings*, in some ways not unlike the territorial markings of other species.

I suggest that in order to "think a counterfactual scenario" (Colebrook 2017: 5) in relation to reclamations and to ask what would have happened if we had not inscribed the difference they represent, we first need to 'excavate' them and thus to unwind them historically. Against the tendency to assimilate them as natural phenomena, we need to give them a history, in other words, to 'unwind' back to the moment of their creation (or one might say 'inscription') and then go back to the moment before that in order to think how the world was, and how we were, before them. I agree with Timothy Morton's view (2017: 147) that an awareness of the present's *continuity* with the past is important to "the question of what kind of world we want to inhabit". This form of observation is, for him, "futuristic because thinking the contours of this continuity is part of how to exit from it: you have to figure out what form of prison you are in before you can escape" (2017: 147).

Sea-level rise and the walk back

When the plane touches down on the runway of Kansai airport in Osaka Bay, you register the thump of several hundred tonnes of aircraft, people and luggage reconnecting with terra firma. You have landed, but what kind of 'land' is this? The two rectangular islands on which Kansai airport rests were created in two stages between 1987 and 2007 by depositing

430 million cubic metres of quarried fill material on the clay floor of the bay (Mesri and Asce 2015). But however massive and imposed the Kansai reclamation is, it is, like all reclamations, contingent on a host of environmental elements remaining favourable to its continued existence. Many reclamations rely on storms not growing in intensity over time until they reach the point where they weaken or carry away the polders and seawalls built to prevent the sea reclaiming the space of the reclamations. Coastal reclamations are contingent on sea levels not rising beyond the point where it is feasible to keep them dry.

In the case of Kansai airport, the analyses carried out by marine engineers in the pre-construction phase failed to predict how quickly and to what extent the Holocene and Pleistocene alluvial clay layers in the seabed would compress, or 'settle', under the load of the reclamation. By 2012 the rate of settlement of the two airport islands had been measured at between 17 and 30 metres, leading to a situation in which, when typhoon Jebi struck on September 4, 2018, with an accompanying 3.29 metre storm surge, the islands were flooded by the sea, trapping over 3,000 passengers and airport staff. Photographs circulated globally showed Renzo Piano's iconic terminal building seeming to be afloat in Osaka Bay.[4]

Kansai airport's 2018 submersion was a 'reminder' of the effect of previous coastal inundations, particularly that which occurred when the sea rose approximately 120 metres following the end of the last glaciation 11,700 years ago (reaching its present level around 2,000 years ago). Archaeologists have made the point that for most of the 200,000 years that modern humans have existed, sea levels have been significantly lower than they are today and thus the global territory available to us as a species was some 20 million square kilometres greater than today (Harff et al. 2016). This extent of habitat is, you might thus say, what we are used to as a species. It is also true, of course, that the experience of witnessing rising sea levels and coastal recession is not new to us. The travellers in Kansai's terminal who looked down through the glass walls at the sea as it advanced over the runways and aprons were re-enacting, in a sense, what our coast-dwelling forebears experienced during the early Holocene coastal recession. In areas of gently sloping terrain, some effects of sea-level rise in the early Holocene "would have been readily apparent within

the lifetime of individuals or within living memory, and, perhaps, were dramatically so. Hence, we may expect that sea-level change would have affected past systems of belief and cosmology, as well as more practical matters of subsistence and social interaction" (Harff et al. 2016: 2). In the lowest-gradient parts of the Sunda Shelf (which joins the landmasses of the Malay peninsula and present-day Indonesia to mainland Southeast Asia) the sea would have moved inland tens of kilometres over the course of a person's lifetime (Wurster and Bird 2016). It is not, then, the phenomenon of sea-level rise itself which is novel in human experience; what is novel is the situation of rising sea levels precipitated by actions of our own, not least among them the discharge into the atmosphere of fossil emissions during air travel.

Applied to coastal reclamations, the kind of counterfactual thinking proposed by Colebrook (2017) would require us to mentally accommodate the geologic timescale of Pleistocene and Holocene sea-level oscillations. One of the more interesting affordances of these reclamations is that they invite us to experience time in an unusually physical way. In some parts of the world, including the Zhongshan area of the Pearl River Delta and the south side of Hangzhou Bay (also in China), coastal reclamations have been extended seaward in a serial manner. Over the course of several centuries, new 'bands' of agricultural reclamation have been added to the outer or 'leading' edge of earlier ones to form a pattern which, when seen from the air, looks not unlike a series of tree rings (Byrne 2018). Archaeologically, the passage of time is typically marked by the vertical accumulation of occupation layers and other anthropogenic, vertically ordered strata so that, in excavating down through these stratigraphic sequences one proceeds vertically back/down through time. With 'serial' reclamations, however, such as those of Zhongshan and Hangzhou, the temporal order is horizontal, meaning that in walking (or bicycling, or driving etc) out across these reclamations we move laterally out through time. Similarly, in Tokyo Bay, one can walk out across a series of adjacent artificial islands, linked by bridges, that date from the 1910s, 1920s, 1960s and later. The experience here is of walking, in a kind of reverse archaeology, out through the stratigraphy of the twentieth century ('reverse' in the sense that here one proceeds from the earliest to the latest, opposite to the way one proceeds in an archaeological excavation).

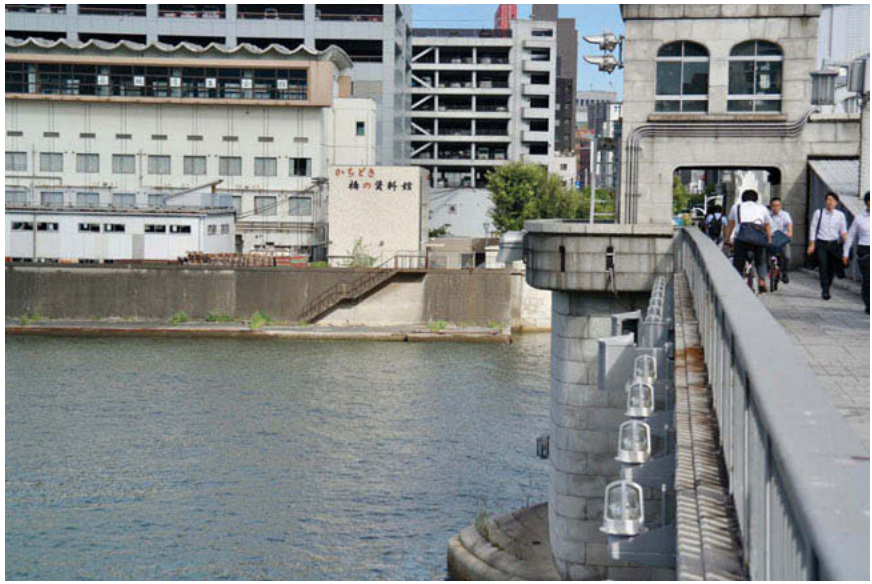

Figure 8.2 — 'Walking out.' A bridge linking the artificial islands on the west side of Tokyo Bay. (Photograph by Denis Byrne, 2016).

Having walked to the end of these reclamation sequences one turns and walks back inland. As the sea rises over the next centuries – the current conservative estimate is a 65cm rise by 2100 (Weeman and Lynch 2018) – people will be required to make the 'walk back' in front of an expanding sea. Although we routinely speak of 'defending' present coastlines against sea-level rise, there is nothing aggressive about the sea's expansion. David Leatherbarrow (1999: 172) offers this depiction of water's agency:

> Water has the virtue of unselfish willingness to sacrifice its present form for the shape of its next container, doing this continually and insistently, as if this act of humility were its lifelong task and higher purpose – as if its charge were to fill up every space it enters the way sound does a room, pressing everything other than itself out of its new container.

Natural coastlines are in a dialogical relation with the sea: they allow incoming tides to enter them, to fill up embayments and submerge mudflats; they allow the sea to erode their headlands, carve out coves, lay down and take away beaches. Equally, as seen in the case of river deltas,

coastlines expand into the sea. Rachel Carson's wonderful books on marine ecology at the water's edge, including *Under the Sea Wind* (1941) and *The Edge of the Sea* (1955), memorably depict these mobile spaces of interpenetration. The 'difference' a reclamation makes is to inscribe a land-sea boundary that in its straightness and hardness is designed to negate and resist interpenetration. It installs an artificial terra firma designed never to sacrifice its own form, never to give up its substance to the sea. In this respect, we must give due attention to seawalls: what they are, what they do and what they teach.

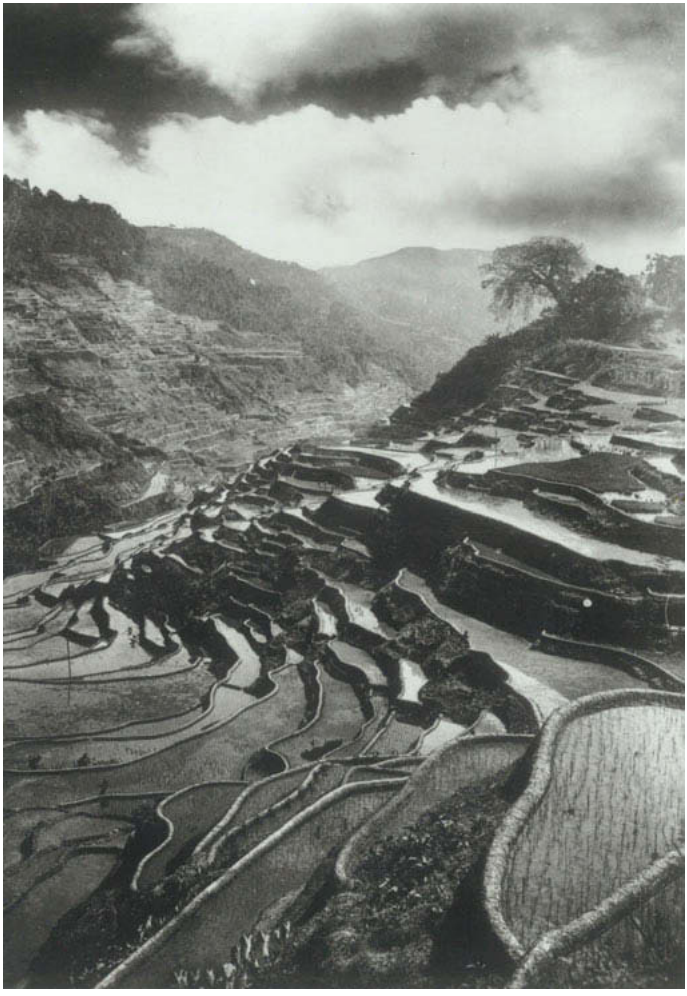

Figure 8.3 — Ifugao rice terraces in the Cordillera of Luzon, Philippines. (Photograph by Frank George, taken between 1890 and 1923. Collection of the Library of Congress).

We might begin by turning inland. Among our first large-scale efforts at levelling land were the terraced fields we inscribed on hillslopes which turned hillsides into cascading sequences of platforms that in many cases are supported by stone walls. In Asia, terracing expanded with the advent of wet rice agriculture and its requirement for dead-flat fields which are effectively ponds in the early part of the crop cycle. The technology of terracing has allowed groups like the Ifugao of the Luzon highlands to occupy steeply dissected terrain in which an economy based on wet rice agriculture would otherwise be impossible (Conklin 1980). What agricultural terracing does is push flat land up the sides of hills whereas coastal reclamations push it out to sea. But the walls that mark the outer edge of these platforms become lines of tension. They require constant, laborious maintenance to counter the effects of erosion. The *difference* made by the generations who built the terraces becomes a legacy of labour for subsequent generations. The same can be said of those who have built the seawalls that support and protect coastal reclamations.

The seawall

The outer edges of coastal reclamations are almost always marked by some form of hard barrier, typically in the form of masonry seawalls (mostly stone or concrete or the two in combination) and revetments. While seawalls 'take' the force of incoming waves, revetments (sloping structures formed of materials such as wood, rock or concrete tetrapods) are designed to absorb and dissipate wave energy. Put simply, reclamations displace the sea, pushing it out of space that it has formerly occupied and thus setting up a line of tension between the mass of the reclamation and the mass of the sea. A reclamation's sea barrier may have to contend with the force of waves, storm wave setup (the effect of a storm front in pushing up the sea level at the coast) and the force of ocean currents, but it also has to contend with the ordinary hydrostatic pressure of the body of water that is the sea. If a reclamation can be thought of as pushing the sea out of a certain space, then it can also be thought to exist in defiance of the ongoing push of the sea to reoccupy that space.

Figure 8.4 — The reclamation and seawall at Elizabeth Bay on Sydney Harbour. (Photograph by Denis Byrne, 2017).

Were a reclamation suddenly to vanish, the sea would flood back into the space it formerly occupied. Free of the limits imposed on it by the reclamation's sea barrier it would, in Leatherbarrow's (1999: 172) terms, reshape itself in accord with the shape of the beaches, inlets and headlands of the former coastline. But even where the reclamation and its sea barrier remain in place, the sea works against or 'worries' the barrier, seeking out its weaknesses, testing its resolve. In an earlier discussion of the nineteenth-century sandstone seawall at Elizabeth Bay, in Sydney Harbour (Byrne 2017: 53), I point to the way the sea and the sea spray oxidize the minerals in the sandstone, causing the stone blocks of the wall to erode relatively quickly (compared, say, to granite seawalls). When the tide is out, a remnant sliver of beach is exposed at the base of the wall, allowing me to examine the effects of this erosion close-up. On one occasion, standing on the beach facing the wall, it occurred to me that as the sandstone blocks eroded, they allowed the sea to advance inland a millimetre at a time back towards where it was prior to the construction of the reclamation in the 1880s. In doing so, the sandstone appeared to be at least as amenable to the sea's impetus as it was to our intention for it to defend the reclamation against the sea. If we concede that the harbour

waves hitting the wall 'intend' not to end there but to run up the sandy surface of the former beach, just as they did in the days before the wall was built, then the eroding wall is responding to the sea's intentions at the same time as it temporarily serves our purpose of keeping the sea out of the reclamation.

Some would say that to speak of the sea's 'intention' to reclaim the space of the reclamation is to fall into the error of anthropomorphizing the sea. I could, alternatively, speak of the sea as having an *impetus* or momentum which would see it reoccupy this space. But I agree with Bruno Latour (2017: 52–54), who, in discussing the measures taken by the US Army Corps of Engineers to stop the Mississippi River spilling over into the bed of the Atchafalaya and hence flooding New Orleans, points to the way the Corps itself has anthropomorphized the Mississippi delta, deploying "the vocabulary of battle" against a "dangerous" river. The whole discourse of coastal engineering posits the sea – particularly the now-rising sea – as a threat that has to be defended against.

Thinking counterfactually, the 'danger' of the Mississippi being captured by the bed of the Atchafalaya is only a danger in relation to the fact that New Orleans and other settlements and infrastructure have been positioned in a way that leaves them vulnerable to the consequences of that capture. Similarly, what makes us particularly vulnerable to sea-level rise is that we have concentrated so much human settlement and infrastructure so close to the coast that we are now deeply committed to sea level remaining static. It is estimated that 450 million people and over 4,000 settlements are located within 20 km horizontal distance and 20 metres elevation of the coastline (Small and Nicholls 2003: 595), and in many countries the proportion of population in near-coastal locations is increasing. To dramatize the situation, people are rushing to the coast and the sea is rising to meet them. I maintain that to ascribe intentions to the sea in Sydney Harbour simply recognizes the nature of the relationship we entered into with the sea when we carried out our reclamations, whereas to think of ourselves as under attack by the sea – or by a non-compliant nature more generally – is to refuse to own our past actions and turn our back on who and what we are. If we are now at heightened risk from the sea it is because we have, in a sense, pushed ourselves *into* the sea.

Conclusion: Paul Virilio goes to the beach

In the language of coastal engineering, the Elizabeth Bay seawall is a 'hard defence'. By way of concluding, I would like to draw a comparison between that seawall and Atlantikwall, the system of concrete bunkers and other fortifications built by Nazi Germany between 1942 and 1944 along the French littoral to defend against an Allied invasion of Europe. With the breaching of the Atlantikwall during the Normandy landings of June 1944, the Allies, like a flood of water, filled up the space of France and pushed German forces back into Germany.

A year later, Paul Virilio, at the tender age of thirteen, took a train to the Normandy coast and had his first encounter with the sea, access to the Atlantic littoral having been forbidden during the German occupation. What he saw when he left the train station at his destination and began walking to the beach was so novel and marvellous to him that he temporarily lost his bearings (Virilio 1994: 10). This is how he described the experience when looking back as an adult:

> Advancing in the midst of houses with gaping windows, I was anxious to be done with the obstacles between myself and the Atlantic horizon; in fact, I was anxious to set foot on my first beach. As I approached Ocean Boulevard, the water level began to rise between the pines and the villas; the ocean was getting larger, taking up more and more space in my angle of vision. Finally, while crossing the avenue parallel to the shore, the earth line seemed to have plunged into the undertow, leaving everything smooth, no waves and little noise. Yet another element was before me: the hydrosphere (1994: 12).

Virilio (1994: 9) describes his discovery of the sea as a "precious experience" and "an event in consciousness of underestimated consequences". He became a great fan of the beach and a frequent visitor to the Atlantic coast. In the course of these visits he naturally became familiar with the Atlantikwall bunkers, now lying derelict. As a young man, he used one of them as a cabana and in 1958 began a photographic survey of them. "I would hunt these grey forms," he tells us, "until they would transmit to me part of their mystery" (1994: 11).

In all, there were 15,000 bunkers making up the 'wall'. Virilio would come to describe them as "funerary monuments of the German dream" (1994: 29) because they represented a fallback of defensive strategy by a military whose initial success had been based on the strategy of offensive speed, or *blitzkrieg*. He would quote a statement made by Mao Tse-tung in 1942: "If Hitler is obliged to resort to strategic defence, fascism is over and done with" (1994: 28).

Virilio's survey of the bunkers became the subject of a 1975–76 exhibition at the Museum of Decorative Arts in Paris which featured his superb black and white bunker photographs, the catalogue for that exhibition (including text by Virilio) forming the basis of the book, *Bunker Archaeology* (1994). But the survey had also been seminal to Virilio's book, *Speed and Politics* (1986), in which he charted the accumulating role of speed in the history of warfare, tracing a sequence that leads from the Medieval fortress whose power lay in its immobile, static resistance through to the "lightning warfare" of the Third Reich in which "stasis is death" (1986: 67).

In seeing a resemblance between the Third Reich's fantasy of installing an impermeable 'wall' across the French littoral and present-day

Figure 8.5 — The seawall recently added to the top of the quay on Honmura Island in Japan's Seto Inland Sea. (Photograph by Denis Byrne, 2016).

projects to build seawalls to protect us against sea-level rise, I am particularly taken with the idea that although Germany instinctively rejected the principle of stasis which the bunkers represented – Virilio (1994: 29) notes the fact the Hitler repeatedly refused ever to visit the wall – the massive solidity of the bunkers provided some sense of security. These "littoral boundary stones" (1994: 11) might be said to have provided a reassurance that this edge of Europe could be rendered as a hard boundary, a concrete frontier, even when fighter planes and bombers had already rendered the idea of such boundaries meaningless. For Virilio (1994: 12), the history of speed – in this case in the form of aircraft – had 'shipwrecked' the Atlantikwall: "These concrete bunkers were in fact the final throw-offs of the history of frontiers" (ibid).

We stand at the end of a 2000-year history of relative sea-level stability, a temporal interval that is negligible geologically but nevertheless seems sufficient for us to cling to the waterline we know rather than begin the 'walk back'. In trying to hold what we have, we confront the fact that much of 'what we have' is not just the coastline bequeathed to us 2,000 years ago when the Holocene marine incursion stalled but also all the territory gained by reclamation. In the battle to hold this expanded version of the mid- to late Holocene coastline, we are beginning to deploy steel-reinforced concrete seawalls, the rough equivalent to the Third Reich's reinforced concrete bunkers. Coincidentally, the concrete tetrahedrons deployed by the German army engineers on the Normandy littoral to trap Allied landing craft and amphibious tanks (Virilio 1994: 27) find their equivalent in the concrete tetrapods typically piled up in front of seawalls to dissipate, or 'trap', wave energy.[5]

Staying with Virilio, I return to the issue of flatness which I maintain is essential to understanding the proliferation of coastal reclamations. In an essay on the place of the Atlantikwall bunkers in Virilio's work, the sociologist Mike Gane (2000) mentions Virilio's discovery that some of the bunkers he examined had toppled over or tilted as the sand dunes they were sited on eroded. This meant that the horizontal plane of their floors was now inclined at an angle. Collaborating with the architect Claude Parent, Virilio began working on designs for 'oblique' buildings and urban precincts in which flat living surfaces were replaced by sloping

ones or where flat surfaces were linked together in assemblages by sloping surfaces (Parent and Virilio 2004) in the form of ramps. Parent and Virilio designed the church of Sainte-Bernadette du Banlay in Nevers, a suburb of Paris, a structure that has inclined floors and looks strikingly like a bunker.

Neither the public nor the architectural profession were receptive to the architecture of the 'oblique function' (Parent and Virilio 2004) and, apart from Sainte-Bernadette du Banlay church, it never achieved physical form. What interests me, however, is that in breaking from the 'static' space of horizontality, to which humanity has been condemned, this architecture, by disorienting the body and demanding of it the effort to walk up and down slopes, was intended to force users to become self-conscious of the way their lives were ruled by the conventional architecture of horizontality or – in my terms, flatness – and to question those conventions. The experience would, in Gane's (2000: 87) words, add "alienation to alienation".

In the case of coastal reclamations, I see no point in seeking to alienate people from the reclamations they inhabit or use. Many of them have no choice but to keep on occupying reclamations and when the time comes that many reclamations are inundated, the resettlement of inhabitants and relocation of industries will no doubt in itself inflict environmental destruction elsewhere.[6] However, as I mentioned earlier, I believe there is value in working to give greater visibility to reclamations and to encourage self-consciousness of what they are and how they got there. Giving them this visibility would contribute to the larger task of giving visibility and tangibility to the Anthropocene, against the agenda of those interests (the oil industry, for example) which seek to make it invisible.

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Notes

1. United Nations, Department of Economic and Social Affairs, 2018, https://www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html.
2. According to a 1996 survey by the Ministry of Land, Infrastructure and Transport, the 'natural coastline' in Japan as a whole totals 17,660 km, the 'semi-natural' coastal areas make up 4,358 km, and 'artificial' coastal areas total 11,212 km (Hesse 2007).
3. See https://www.concretedisciples.com/skatepark-directory/skateparks/japan_c97/.
4. Ibid. The airport authority maintains that its use of 'sand drain' technology has now slowed the rate of subsidence; see Kansai International Airport Land Co., 'Technical Information, Approach to Settlement, Condition of Settlement', http://www.kiac.co.jp/en/tech/sink/sink3/index.html.
5. So ubiquitous have tetrapods become in the coastal landscape of Japan they have become subjects of cult interest (Hesse 2007).
6. I am indebted to Paul James (Western Sydney University) for raising this point in a discussion in February 2019.

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